CLAIMS

1. A coating thickness measuring instrument having a first mode of operation in which the instrument is operative to make measurements with a first resolution and a second mode of operation in which the instrument is operative to make measurements with a second resolution, the first resolution being greater than the second resolution.

2. The instrument of claim 1, wherein when the instrument is in the first mode, the instrument is operative to make measurements in a first range and when the instrument is in the second mode, the instrument is operative to make measurements in a second range.

3. The instrument of claim 1, wherein when the instrument is in the first mode, the instrument is operative to make measurements in a first range at a high resolution and when the instrument is in the second mode, the instrument is operative to make measurements in a second range at a lower resolution, the second range being longer than the first range.

4. The instrument of claim 1, wherein when the instrument is in the first mode, the instrument is operative to make measurements in a first range and when the instrument is in the second mode, the instrument is operative to make measurements in a second range, such that the first range and the second range overlap.

5. The instrument of claim 1, further including an inductive probe comprising a drive coil, and two pickup coils.

6. The instrument of claim 1, further including an inductive probe comprising a drive coil and two pickup coils; and

a means to drive an alternating current of substantially constant amplitude in the drive coil.

7. The instrument of claim 1, further including:

an inductive probe comprising a drive coil and two pickup coils; and

a means to drive an alternating current of substantially constant amplitude in the drive coil;

wherein the means to drive an alternating current comprises an oscillator and associated control loop circuit arranged to control the oscillator in dependence upon current flowing in the drive coil.

8. The instrument of claim 1, further including:

an inductive probe comprising a drive coil and two pickup coils; and

a means to drive an alternating current of substantially constant amplitude in the drive coil; and

a means for varying the amplitude of alternating current flowing in the drive coil;

wherein the means to drive an alternating current comprises an oscillator and associated control loop circuit arranged to control the oscillator in dependence upon current flowing in the drive coil.

9. The instrument of claim 8, wherein the means for varying the amplitude comprises a digitally controlled potentiometer.

10. The instrument of claim 1, further including:

an inductive probe comprising a drive coil and two pickup coils; and

a means for sensing variation in coupling between the drive and pickup coils and converting the variation in coupling to a thickness value.

11. The instrument of claim 1, further including:

an inductive probe comprising a drive coil and two pickup coils; and

a means for sensing variation in coupling between the drive and pickup coils and converting this to a thickness value;

wherein said means for sensing comprises a differential amplifier, means for rectifying the output of the pickup coils and an analog to digital converter.

12. The instrument of claim 1, further including:

an inductive probe comprising a drive coil and two pickup coils; and

a means for sensing variation in coupling between the drive and pickup coils and converting the variation in coupling to a thickness value, said means for sensing comprising a differential amplifier, means for rectifying the output of the pickup coils and an analog to digital converter;

wherein the means for rectifying comprises a synchronous detector controlled by a synchronizing signal derived from the means to drive an alternating current in the drive coil.

13. The instrument of claim 1, further including:

an inductive probe comprising a drive coil and two pickup coils; and

a means to modify the amplitude of current flowing in the drive coil in dependence upon output from the pickup coils.

14. The instrument of claim 1, further including:

an inductive probe comprising a drive coil and two pickup coils; and

a means to modify the amplitude of current flowing in the drive coil in dependence upon output from the pickup coils;

wherein the means to modify the amplitude comprises a control loop arranged to reduce the amplitude of current supplied to the drive coil as differential output of the pickup coils increases.

15. The instrument of claim 1, further including:

an inductive probe comprising a drive coil and two pickup coils;

a means to modify the amplitude of current flowing in the drive coil in dependence upon output from the pickup coils; and

a switch to enable the control loop to be switched in and out of operation, in order to switch the instrument between the first and second modes;

wherein the means to modify the amplitude comprises a control loop arranged to reduce the amplitude of current supplied to the drive coil as differential output of the pickup coils increases.

16. The instrument of claim 1, comprising:

a microprocessor; and

a memory, the memory being operative to store look-up tables for both long and short range modes of operation and the microprocessor being operative to generate a coating thickness value using one of the look-up tables.

17. A coating thickness measuring instrument, comprising:

an inductive probe having a drive coil and a pickup coil;

a means for driving an alternating current in the drive coil;

a means for detecting the output of the pickup coil; and

a means for modifying the current in the drive coil in dependence upon the output of the pickup coil.

18. The instrument of claim 17, wherein the means for modifying the current in the drive coil comprises a control loop which is switchable in and out of operation to provide two modes of operation for the instrument.

19. The instrument of claim 18, wherein the means for modifying the current in the drive coil comprises a first control loop which is switchable in and out of operation to provide two modes of operation for the instrument and wherein the means for driving a current in the drive coil comprises a second control loop arranged to maintain the amplitude of current in the drive coil at a substantially constant level.

20. The instrument of claim 17, wherein the means for modifying the current in the drive coil comprises a first control loop which is switchable in and out of operation to provide two modes of operation for the instrument and wherein the means for driving comprises an amplitude controlled oscillator and the first control loop is implemented by a current to voltage rectifier, a low pass filter and an error amplifier.

21. The instrument of claim 17, wherein the means for modifying is arranged to modify the input to the error amplifier and the amplitude of the current in the drive coil.

22. The instrument of claim 17, wherein the means for detecting the output of the pickup coil comprises a synchronous detector.